Christopher A. Hart, attorney, engineer, and pilot, was appointed to the NTSB in 2009; he served as acting chair starting in 2014 and then as chair from 2015 to 2017. He also spent much of his career working for the FAA and National Highway Safety Transportation Administration. He was chosen to serve as the chairman of the FAA’s Joint Authorities Technical Review (JATR) team that made recommendations about improving the FAA’s process that approved the now-grounded Boeing 737 MAX.

A&SL: You've worn a lot of different hats in your career that have all been rooted in safety. And you're a lawyer, an engineer, and a pilot. Can you tell us about those different positions that you have held in your career and how that background prepared you for those roles?

CH: My mother once told me that the first thing she ever saw me draw was an airplane; I am an aviation addict, and much of what I have done is centered around aviation. Most of the positions I have held have enabled me to take advantage of my combination of engineering, legal, and piloting backgrounds. For example, when I was at the FAA, I developed a program called GAIN, Global Aviation Information Network, which was created to enable the worldwide aviation community to collect, analyze, and share aviation safety information to use it proactively to prevent accidents. The program began with reporting from pilots, so my piloting background enhanced my understanding of the concerns that pilots might have about reporting about potential safety issues, and being a pilot enhanced my credibility with the pilot population when I encouraged them to report potential issues. Many of the reports were about design issues, so my engineering background enhanced my substantive understanding of the merits of the concerns that were being reported. Removing many of the obstacles that discouraged pilots from reporting about potential safety issues involved legislation and regulations, so my legal background was helpful for that.

Similarly, many of the issues that I encountered at the NTSB involved both engineering and legal challenges, and being a pilot helped me better understand those issues.

Some people thought that going to law school after engineering school was a mistake, but the combination has been very powerful and enormously useful in most of my career.

A&SL: You were a member of the National Transportation Safety Board in the early 1990s and then again from 2014 to 2017, including as the chairman of the Board. What was it like to go back to the Board for another term and as chairman?

CH: Being an NTSB Member was thoroughly gratifying because I could see so many transportation safety improvements from what we did. It was also thoroughly enjoyable to work on subjects that were up close and personal, since I drive and fly and ride trains like we all do every day. Returning to the NTSB after being away for 16 years was even more gratifying because I returned as vice chairman and later became chairman.

As chairman, I informed the staff that because the transportation industries were very innovative, the NTSB would also have to be innovative to avoid getting “left behind.” I used the example of Kodak, which filed for bankruptcy because it was still making film while people were increasingly taking pictures with electrons. Recognizing that being innovative often requires out-of-the-box thinking, which may involve making mistakes, I emphasized to the staff that when I learned of a mistake, I would assume positive intent and regard such mistakes as an indication of efforts to be innovative, rather than as a basis for punishment. I received many compliments from the staff for having that attitude about how the agency should operate in order to continue playing a significant and leading role in improving transportation safety.

Imagine my surprise and excitement when, to honor my service as NTSB chairman, current NTSB Chairman Robert Sumwalt named an NTSB conference room after me. Thank you so much, Chairman Sumwalt!

When all is said and done, what’s not to like about having the staff do all of the hard work while I, as chairman, got the credit?

A&SL: What has been the biggest safety challenge that you have seen in aviation?

CH: I see two major safety challenges in aviation, one of which has already manifested itself and the other of which is just over the horizon.
The challenge that has already manifested itself is that as aircraft systems become more complex and interconnected, the potential failure modes become less predictable. When the failure modes were more predictable, it was easier to decide what to train in the simulator to help ensure that if pilots encountered problems in operation, they would have already seen the problems in the simulator and would be more likely to respond appropriately. The increasing complexity of systems has resulted in an increasing number of accidents in which pilots encountered problems in operation that they had never seen before, even in training, and they responded inappropriately. The two tragic 737 MAX crashes are just the latest in a series of accidents over the last decade or so in which pilots responded inappropriately to problems that they had never seen before, and I anticipate that this problem will become worse as aircraft systems continue to become increasingly complex.

The challenge that is just over the horizon is that the more capable and reliable automation becomes, the more the pilots become mere monitors. Not only has aviation experience demonstrated that humans are not good monitors of very reliable systems, but I am concerned about the fundamental disconnect that will result when highly trained, skilled, and competent pilots are expected to be mere monitors. At worst, this may undercut professionalism. I loosely describe professionalism as maintaining focus on the operational tasks at hand and performing them effectively, efficiently, and safely, and with a personal commitment to doing a job well—even when nobody is looking, as they say—as opposed to coming to work simply for a paycheck. In my view, professionalism is the foundation of a safe aviation transportation system.

**A&SL: What do you feel was your greatest safety accomplishment so far in your career?**

CH: My greatest safety accomplishment was developing programs at the FAA that helped the aviation industry systemically pursue the process of collecting, analyzing, and sharing safety data to use it proactively to prevent accidents. Perhaps the most important foundational part of that effort was that I spearheaded the legislation that protected voluntarily supplied safety data from public disclosure. This legislation, which was enacted as part of the FAA’s 1996 reauthorization package, formed the foundation for 49 C.F.R. Part 193, which opened the pipeline of safety information from the industry about daily operational issues by protecting voluntarily supplied safety (and security) data from public disclosure. That, in turn, is why ASIAS, the Aviation Safety Information and Analysis System, now contains flight recorder data from millions of flights and is a rich source of data that is being used extensively and proactively to further improve aviation safety.

**A&SL: What are you doing now?**

CH: I am thoroughly enjoying my “retirement” by engaging in activities in which I can apply my NTSB and FAA risk management background and experience to improving safety in various domains.

For example, the FAA asked me to lead its Joint Authorities Technical Review, in which aircraft certification technical experts from nine aviation regulatory authorities around the world, plus NASA, conducted what was essentially a peer review of the FAA’s process for approving the flight control systems of the 737 MAX. The objective of this peer review was to examine the robustness of the process and make recommendations as needed to enhance that robustness. The JATR made its recommendations to the FAA in October, whereupon the FAA made the recommendations public.

I was also asked to chair the Washington Metrorail Safety Commission, which was created last year to oversee the safety of the Washington, D.C., area subway system. For most mass transit properties in the United States, the first-level safety oversight is provided by the state, typically through the state’s department of transportation or public utilities commission. That regulatory model has been a challenge in Washington because its subway is the only mass transit system in the country that services three jurisdictions: Maryland, Virginia, and D.C. The WMSC, which is led by six commissioners, two from each jurisdiction, is an effort to respond to this tri-jurisdictional challenge and improve the safety of the subway system.

I am also engaged as a consultant with a public utility to improve its public safety as well as its workforce safety. I firmly believe that the airline industry collaboration success story, CAST (Commercial Aviation Safety Team), is transferable to many industries that are involved in potentially hazardous endeavors, including other transportation modes, nuclear power, petroleum exploration and refining, chemical manufacturing, and health care, to name a few. The airline fatal accident rate, after declining significantly for decades, began to “flatten” onto a plateau in the early 1990s. CAST was created to get the decline started again. Despite the prediction of many safety experts that the rate could not be improved much, CAST reduced the fatal accident rate from the plateau by more than 80 percent in less than 10 years. I am eager for opportunities to transfer that amazing safety improvement story to other industries.

In addition to that, I thoroughly enjoy public speaking, and I am often invited to give presentations about various legal issues, such as the adverse impacts of overzealous criminalization of accidents upon safety improvement efforts and the use of “just culture” concepts to help improve safety. I also speak about a variety of other issues, such as the power of CAST-type collaboration and “System Think” to improve the safety of complex systems of connected and coupled...
subsystems, improving safety through the development of high reliability organizations (HROs), automation issues in general, automation issues as reflected in the 737 MAX, automation issues on the ground as applied in autonomous vehicles (where the AV makers are making many of the same automation mistakes that aviation made decades ago), and issues related to urban air mobility (pilotless aerial taxis).

In short, when I left the NTSB, I promised that I was not going to stay at home watching Ellen, and I am happy to say that I have been fulfilling that promise.

**A&SL: It’s hard to imagine that you have a lot of free time, so I’m sure the time you do find is precious. What do you like to do when you’re not working?**

**CH:** I enjoy watching old movies and TV shows, and I enjoy mentally challenging games, such as Sudoku and Spider Solitaire. Someday I would like to take up angel flying, taking people on medical missions at no cost to them, but as they say about flying, you shouldn’t do it at all unless you do it enough to stay proficient, so I’m not sure that will be happening any time soon.

**A&SL: What was the last book you read and where was the last place you visited on vacation?**

**CH:** I just finished a book about how the use of cargo containers was revolutionary to the transportation of goods, so much so that it enabled a variety of new industries to grow because of the significant reduction in the cost of transporting goods. Now I’m reading a book about medical issues associated with inbreeding of isolated populations, in this case disproportionate hereditary deafness among the residents of Martha’s Vineyard in the 1700s and 1800s.

My most recent vacation was to Sweden, thanks to Volvo, who pays two airfares to Sweden plus hotel to enable people to go to Sweden to buy their Volvo at the factory. While you’re there, you can drive your new car around Sweden and elsewhere to do the tourist bit; then when you return the car to the factory, they ship it to the States. My wife and I took this trip during our daughter’s spring break so that she could go with us, since none of us had ever been to Sweden before. What a marvelous place!